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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,846	06/19/2003	Raymond Kong	X-1317 US	8489
24309	7590	07/06/2005	EXAMINER	
XILINX, INC ATTN: LEGAL DEPARTMENT 2100 LOGIC DR SAN JOSE, CA 95124			SIEK, VUTHE	
			ART UNIT	PAPER NUMBER
			2825	

DATE MAILED: 07/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/600,846

Applicant(s)

KONG, RAYMOND

Examiner

Vuthe Siek

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>04/08/03</u> 4/8/03 | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to application 10/600,846 filed on 6/19/2003.

Claims 1-20 remain pending in the application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-20 are rejected under 35 U.S.C. 102(a/e) as being anticipated by Dutta et al. (6,349,403) in view of Teig et al. (US 2003/0066043 A1).
4. As to claims 1, 8, 12-16, Dutta et al. teach a method for determining signal routing cost for an IC (cost-based coarse router for a computer controlled IC design), the IC design having topology units and routing resources (Figs. 2-16 and its description), comprising determining a respective span in terms of one or more of the topology units for each of the routing resources (Examples in Figs. 2-3, 7-9); assigning a cost value to each of the routing resources using the respective span associated therewith (costs for possible wire path connecting a pair of pins (nodes) are computed); selecting a routing resources from the routing resources (taking cost as consideration when routing with low cost, the most effective path is then selected); calculating at least one distance between the routing resource and at least one other of the routing resources (the cost formula for a given wire route includes Cost1 that is based on

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Manhattan Distance of the wire length; col. 7, lines 56-67); and computing a future cost value for the at least one distance using the cost value assigned to the routing resource (col. 7 line 43 to col. 8 line 20; col. 10-12, specifically col. 10). Dutta et al. do not teach each of the topology units is same or similar to the other topology units. Teig et al. determining routing based on assigning cost to each of routing resources, where the routing is based on Steiner trees (routing topology units), where each of the topology units is same or similar to the other topology units, because this would facilitate the placement and routing tool to explore all shortest paths between nodes of the closest configuration (Fig. 6-10, 22, 25, 27-28, 29, 30, 31, [0162-0169, 0218-0227, 0254-0261, 0620-0635). Therefore, by combining these above teachings, it would have obvious to one of ordinary skill in the art at the time the invention was made the claimed invention.

5. As to claims 2, 10 and 17, Dutta et al. teach the cost formula including cost based on Manhattan distance for the wire length from a source to a target and storing the value as lowest cost, col. 7, 10). It is noted that the Manhattan distance comprising two dimensional directions. Therefore Dutta et al. storing cost would have include storing the future cost value for the at least one distance in a two-dimensional table indexed by a vertical distance and a horizontal distance in order to select lowest cost when finish routing.

6. As to claims 3 and 18, Dutta et al. teach the routing resource is located at one corner of the IC (Figs. 7-9).

7. As to claim 5, Dutta et al. teach cost formula including a cumulative cost, cost based on Manhattan distance, setting a future cost as lowest cost (col. 7, col. 10).
8. As to claim 6, Dutta et al. teach cumulative routing cost (total cost) of the at least one other of the remaining routing resources including a cumulative routing cost of the routing resource and the cost assigned (computed cost) to the at least one other of the remaining routing resources (col. 7, 10).
9. As to claim 9, Dutta et al. teach costs for possible wire path connecting a pair of pins (nodes) are computed for selecting low cost performed by cost-based coarse router.
10. As to claims 4 and 19-20, Dutta et al. teach a method for determining signal routing cost for an IC (cost-based coarse router for a computer controlled IC design), the IC design having topology units and routing resources (Figs. 2-16 and its description). It is noted that the IC design could be a programmable logic device including programmable logic blocks within the programmable logic device. Thus, the topology units would be associated with programmable logic blocks within the programmable logic device.
11. As to claims 7 and 11, Dutta et al. teach routing resource intersects in at least one of a vertical direction and a horizontal direction within a topology unit (Figs. 2-3, 7-13). Dutta et al. do not explicitly teach determining comprising identifying a number of topology units, the routing resource intersects in the at least one of a vertical and horizontal directions. It is noted that the IC design could be a programmable logic device (PLD) including programmable logic blocks (PLBs) within the programmable

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logic device. Thus, the topology units would be associated with programmable logic blocks within the programmable logic device. Dutta et al. Therefore, it would been obvious to one of ordinary skill in the art would have recognized that during the cost-based coarse routing process in IC design as taught by Dutta et al. would have included identifying a number of topology units, the routing resource intersects in the at least one of the a vertical and horizontal directions thereby the cost-based coarse routing process of an IC design included PLD having PLBs within would have been done with cost effective.

Double Patenting

12. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

13. Claims 1-20 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-8 of U.S. Patent No.6,501,297 in view of Teig et al. (US 2003/0066043 A1). Although the conflicting claims are not identical, they are not patentably distinct from each other. The patent claims teach all limitations except for future computing future cost value, storing the

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future cost in a two-dimensional table indexed by a vertical distance and a horizontal distance and cumulative routing cost. Teig et al. teach these limitations (see (Fig. 6-10, 22, 25, 27-28, 29, 30, 31, [0162-0169, 0218-0227, 0254-0261, 0620-0635).

Combining the teachings of Teig et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made the claimed invention because it would facilitate the placement and routing to explore all shortest paths between nodes of the closest configuration during routing process.

Remarks

14. Applicant argued that Dutta does not teach the amended claim limitation. Teig et al. teach such limitation as described in the above rejection that would have been rendered the claims obvious with the combination of teachings.

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vuthe Siek whose telephone number is (571) 272-1906. The examiner can normally be reached on Increase Flextime.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Vuthe Siek


VUTHE SIEK
PRIMARY EXAMINER